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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,331	11/07/2005	Hiroshi Asami	075834.00424	5772

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ROBERT J. DEPKE
LEWIS T. STEADMAN
ROCKEY, DEPKE, LYONS AND KITZINGER, LLC
SUITE 5450 SEARS TOWER
CHICAGO, IL 60606-6306

EXAMINER

HESS, MICHAEL THOMAS

ART UNIT	PAPER NUMBER
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3709

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/523,331

Applicant(s)

ASAMI ET AL.

Examiner

Michael T. Hess

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/24/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All. b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/28/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as being misnumbered. In Applicant's amendment, received on January 24, 2005, in which the Applicant requested the Examiner to discard Figures 7A through 7G and 8A through 8C, the subsequent Figures were not renumbered. Thus, all figures after Figure 6 are misnumbered. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheets should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure was canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. In Figures 13A through 13F, a "conventional method" is interpreted as being prior art and thus, should be designated by a legend such as --Prior Art-- because only that

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which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD OF MANUFACTURING A DEVICE-INCORPORATED SUBSTRATE AS WELL AS A METHOD OF MANUFACTURING A PRINTED CIRCUIT BOARD.

4. The disclosure is objected to because of the following informality: the term "insulating film" on page 22, line 30 of the specification should be labeled with reference numeral 87.

Appropriate correction is required.

5. The disclosure is objected to because of the following informalities: references to Figures 9-13 need to be amended in the Specification to correspond to Figures as renumbered per the above drawing objection.

Appropriate correction is required.

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6. Claim 1 is objected to because of the following informalities: the terms "a one" on Line 7 of claim one is grammatically incorrect; and on Line 10 of claim a "to" should be inserted between "layer" and "each." Appropriate correction is required.
7. Claim 5 is objected to because of the following informality: "in" on Line 4 of Claim 5 should be replaced with "of." Appropriate correction is required.
8. Claim 6 is objected to because of the following informality: "to" should be inserted between "layer" and "each" on Line 6 of Claim 6. Appropriate correction is required.
9. Claim 10 is objected to because of the following informality: "multiply" on Line 3 of Claim 10 should be replaced with "multiple times." Appropriate correction is required.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in the section titled BACKGROUND ART in view of US Pat. No. 4,604,160 to Murakami, et al. (Murakami) and Japanese Pub. No. 05-055758 to Matsushita Electric (Matsushita).

In Reference to Claim 1

The AAPA teaches the following elements of claims 1:

A method for manufacturing a device-incorporated substrate having an insulating layer, a conductor pattern thereon, a void section formed therein, and an electric device housed in said void section and connected to said conductor pattern, said method comprising (AAPA, Fig. 13A-13F):

a void section forming step of forming a void section in said insulating layer (AAPA p. 2, Lines 30-31);

a pattern forming step of forming said conductor pattern on a one surface of a transfer sheet (AAPA P. 3, Lines 3-4) made of metal;

a pattern transfer step of adhering said transfer sheet and said insulating layer each other with said conductor pattern therebetween (AAPA P. 2-3), and removing said transfer sheet; and

a device housing step of housing said electric device within said void section, with said electric device connected to said formed conductor pattern (AAPA P. 3, Lines 13-25).

However, the AAPA fails to disclose and is silent as to the inclusion of a metal transfer sheet and the removal of the transfer sheet including a step of partially dissolving the transfer sheet after forming a seal resin layer between conductor pattern and electric device.

Murakami explicitly teaches a metal transfer sheet (Column 2, Lines 4-14; Column4, Lines 25-28) and the removal of the transfer sheet, at least partially by dissolving the transfer sheet (Column 2, Lines 12-13).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the explicitly taught steps of plating a metal transfer sheet; transferring the plated pattern to a substrate, and removing the metal transfer sheet as in Murakami, in order to produce extremely thin, highly accurate and delicate printed boards, which have high circuit density. (Murakami Columns 3-4, Lines 68-3).

Matsushita explicitly teaches forming a seal resin layer between the conductor pattern and the electric device (paragraph 9, lines 6-8).

It would have been obvious to one having ordinary skill in the art at the time of the invention to have used the explicitly taught use of a seal resin layer between the conductor pattern and the electric device to enhance the productivity of multilayer boards. (Matsushita, Paragraph 7).

In reference to Claim 2

Murakami further teaches:

The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

said transfer sheet comprises a metallic base and a dissolvee metal layer that is layered so as to be separable with respect to said metal base material and onto which said conductor pattern is formed (Murakami Column 2, Lines 4-14; Column 4, Lines 25-28); and

removal of said transfer sheet includes a step of separating and removing said metal base material from said dissolvee metal layer, and a step of dissolving

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and removing said dissolvee metal layer (Murakami Column 2, lines 4-14;
Column 4, Lines 25-28).

In Reference to Claim 3

Murakami further teaches:

The method for manufacturing a device-incorporated substrate as
described in claim 1, characterized in that:

said pattern forming step is done by an electroplating method (Murakami
Column 2, Lines 7-9).

In Reference to Claim 4

Murakami further teaches:

The method for manufacturing a device-incorporated substrate as
described in claim 1, characterized in that:

said pattern forming step includes a step of forming a conductor pattern on
one surface of said transfer sheet and a step of burying an insulating material in
the gaps in said formed conductor pattern and of flattening said surface of said
transfer sheet (Murakami Column 4, Lines 34-35).

In Reference to Claim 5

Murakami further teaches

The method for manufacturing a device-incorporated substrate as
described in claim 1, characterized in that:

an adhesive material is applied onto one surface of said insulating layer in
advance in said pattern transfer step (Murakami Column 2, Lines 17-20).

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In Reference to Claim 6

The AAPA and Matsushita further teaches:

The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

said device housing step includes a step of adhering said transfer sheet and said insulating layer to each other (AAPA P. 2, Lines 10-18), and thereafter housing said electric device into said void section and connecting said electric device to said conductor pattern (Matsushita Paragraph 9, Lines 6-8).

In Reference to Claim 8

Murakami further teaches:

The method of manufacturing a device-incorporated substrate as described in claim 2, characterized in that:

said dissolvee metal layer and said conductor pattern are made of different metal material and said step of dissolving and removing said dissolvee metal layer is done by using an etchant which is able to dissolve said dissolvee metal layer but is unable to dissolve said conductor pattern (Murakami Column 4, Lines 35-37).

In Reference to Claim 9

The AAPA further teaches:

The method for manufacturing a device-incorporated substrate as described in claim 1, characterized in that:

said void forming step includes a step of forming a through hole together with said void section, for connecting both surfaces of said insulating layer, and a step of filling conductive material into said through hole (AAPA P. 2-3, Lines 31-3).

In Reference to Claim 10

The AAPA further teaches:

The method for manufacturing a device-incorporated substrate as described in claim 9, said method characterized by further comprising:

layering said formed device-incorporated substrates multiply {sic} with electric connection at said through hole, after said step of filling conductive material (BACKGROUND ART p. 2. lines 19-21.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kanzawa et al. has been included because it describes the making of a transfer sheet and connecting the transfer sheet to an insulating substrate and an electrical device. Andou et al. has been included because it discusses electroplating a conductor pattern.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael T. Hess whose telephone number is 571-272-0229. The examiner can normally be reached on 6:30 am - 5:00 PM, Monday - Thursday.

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14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Bomberg can be reached on 571-272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MTH


KENNETH BOMBERG
PRIMARY EXAMINER